No. 7300100

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Cornell University
Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *seventeen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'Multileaf'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 16th *day of* March / *in the year of our Lord one thousand nine hundred and* seventy-eight

Attest:

Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-470
(12-15-72)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1. VARIETY NAME OR TEMPORARY DESIGNATION	2. KIND NAME	FOR OFFICIAL USE ONLY
'Multileaf'	Alfalfa	PV NUMBER 73100
3. GENUS AND SPECIES NAME	4. FAMILY NAME (*Botanical*)	FILING DATE 6·18·73 / TIME 11:00 A.M.
Medicago sativa	Leguminosae	FEE RECEIVED $ 250.00 / $ 250.00 / $ 250.00 — BALANCE DUE $ 6/18/73 / $ 11/10/76 / $ 11/9/77
	5. DATE OF DETERMINATION: 11 October 1972	

6. NAME OF APPLICANT(S)	7. ADDRESS (*Street and No., or R.F.D. No., City, State, and ZIP Code*)	8. TELEPHONE AREA CODE AND NUMBER
Cornell University Agricultural Experiment Station	Cornell University Ithaca, New York 14853	607-256-5420

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. STATE OF INCORPORATION	11. DATE OF INCORPORATION
State Agricultural Experiment Station	New York	1888

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

R. P. Murphy
Department of Plant Breeding and Biometry
Cornell University
Ithaca, New York 14853 Telephone 607-256-3101

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

[X] 13A. Exhibit A, Origin and Breeding History of the Variety (*See Section 52 of the Plant Variety Protection Act.*)

[X] 13B. Exhibit B, Botanical Description of the Variety

[X] 13C. Exhibit C, Objective Description of the Variety

[X] 13D. Exhibit D, Data Indicative of Novelty

[X] 13E. Exhibit E, Statement of the Basis of Applicant's Ownership

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? (*See Section 83(a). (If "Yes," answer 14B and 14C below.)*) [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? [X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) of this sexually-reproduced novel plant variety believes that the variety is distinct, uniform, and stable as required in Section 41 and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

March 23 1976
(DATE)

J. F. Hoff
(SIGNATURE OF APPLICANT)

(DATE)

Assoc DIRECTOR
(SIGNATURE OF APPLICANT)

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73100

13A. Exhibit A

Origin and Breeding History of the Variety

1. 'Multileaf' originated from research in the Department of Plant Breeding and Biometry, Cornell University Agricultural Experiment Station, New York State College of Agriculture, Cornell University, Ithaca, New York. The original plants were selected for extra leaflets per leaf from the breeding nurseries. The first population of plants was produced from eleven plants in the nurseries each of which exhibited a low level of expression of the multifoliolate character. The origin of these plants was: five from the breeding population that produced 'Saranac', three from the breeding population that produced 'Iroquois', two from the cultivar 'Narragansett', and one of unknown origin from an old field in New York. Five cycles of recurrent selection for extra leaflets per leaf were made since 1959.

2. Selection has also been based on vigor, winter survival and resistance to the bacterial wilt disease. All selections have been made in field nurseries.

3. One hundred parent clones were interpollinated to produce breeder seed of this cultivar.

4. The within cultivar uniformity is similar to that for others developed at this experiment station, i.e. 'Saranac' and 'Iroquois', and 'Vernal' and 'Lahontan' and meets the uniformity requirements of alfalfa cultivars. See Exhibit C. The most distinguishing characteristic is the multifoliolate character; we expect less than one percent of the population to be trifoliolate. Not all leaves on a multifoliolate plant exhibit the character; individual plants may vary from 50 to 85 percent of their leaves having more than three leaflets. The percentage of multifoliolate plants in the cultivar has remained stable through two generations beyond the Breeder seed generation.

73100

13B. Exhibit B

Botanical Description of the Variety

'Multileaf' is typical of Medicago sativa except for the expression of the multifoliolate character (more than three leaflets per leaf). The seed pods are coiled. The flower color is characterized as follows: 46% light through dark purple, 40% light through dark reddish purple, 12% purple to blue as flowers age, and 2% purple to some variegation as flowers age.

13C. Exhibit C

73100

Objective Description of the Variety

'Multileaf' alfalfa is a winter-hardy cultivar under the climatic conditions of Central New York. It is resistant to the bacterial wilt disease. Growth type, regrowth characteristics and fall dormancy reaction are similar to those of the cultivar 'Saranac'. Performance information indicates total-season dry matter production of 'Multileaf' to be 90-95% of that for the 'Saranac' and 'Iroquois' cultivars. Determinations of leaf percentage of total dry matter have indicated 'Multileaf' exceeds 'Saranac' by 2 to 3% for forage managed and harvested under the same conditions.

73100

13D. Exhibit D

Data Indicative of Novelty ('Multileaf' 73100)

Novelty is based on the characteristic of multifoliolate leaves (more than three leaflets per leaf). The most similar cultivars are Iroquois and Saranac.

Cultivar	Percent of plants with multifoliolate leaves	Percent of leaves on individual plants with more than three leaflets
'Multileaf'	99	55 to 85
'Iroquois'	>1	>1
'Saranac'	>1	>1

Multifoliolate leaves have 5 leaflets most frequently. Expression of the multifoliolate leaf character appears to be somewhat greater on forage produced during the cooler and shorter days of early spring and late fall than in mid-summer.

'Multileaf' may be distinguished from all cultivars known to us very clearly because of its multifoliolate leaf character. See Exhibit C. 'Multileaf' is the only cultivar known to us which exhibits the multifoliolate leaf character.

73100

Enclosure 1

Data from a bacterial wilt test on 10 varieties tested with two sources of inoculum (Minnesota and New York). There were no variety x source of inoculum interactions. Conducted in the field in 1975 at Ithaca, N. Y. by R. P. Murphy.

Variety	Wilt Score (Reaction and survival)
Agate	0.77
Iroquois	1.14
Saranac AR	1.17
Vernal	1.34
Saranac	1.45
Apollo	1.45
Honeoye	1.66
Ranger	1.81
WL-305	1.89
DuPuits	3.35

All of these varieties are described as resistant except DuPuits.

73100

Enclosure 2

Data from anthracnose test on varieties included in the 1974 Alfalfa Variety Test sponsored by NE-74 Regional Research Project (Courtesy U.S. Regional Pasture Research Laboratory).

Variety	Anthracnose Score (0=immune to 5=dead)
Saranac AR	2.67
Arc	2.68
Ramsey	3.64
Agate	3.81
Titan	4.18
Aztec	4.40
530	4.59
520	4.62
Honeoye	4.64
Victoria	4.68
Multileaf	4.78
Iroquois	4.81
Saranac	4.84
Kodiak	4.88
Bonus	4.98

This test was conducted in a plant growth chamber and at a very high level of infection. Data recorded on 4/7/75.

73100

Enclosure 3

Observations from variety yield trials on the multifoliolate character:

None of the following varieties show a degree of multifoliolate plants as does Multileaf (±99% of plants with some degree of this character). A trace of such plants (±1%) may be found in Narragansett.

Agate	Phytor
Alfa	Ramsey
Americana	Team
Anchor	Thor
Apollo	Titan
Arc	Vernal
Aztec	Victor
Bonus	Vista
Cardinal	Weevlchek
CW-5	WL-218
Dawson	WL-219
DuPuits	WL-305
Gemini	WL-307
Glacier	WL-309
Kanza	WL-311
Klondike	WL-318
Kodiak	131
Nugget	167
Narragansett	520
Olympian	521
Pacer	530

73100

Enclosure 4

Observations from variety yield trials on flower color:

None of the following varieties show a significant degree of variegated or yellow flowered plants as does Honeoye (±85% of plants with variegated or yellow flowers).

Alfa	Phytor
Anchor	Team
Apollo	Thor
Arc	Victor
Aztec	Vista
Bonus	WL-219
Cardinal	WL-305
CW-5	WL-307
Dawson	WL-309
DuPuits	WL-311
Kanza	WL-318
Klondike	131
Kodiak	520
Nugget	521
Olympian	530

73100

13E. Exhibit E

Statement of Applicant's Ownership

The Cornell University Agricultural Experiment Station is the owner of 'Multileaf'.

FORM APPROVED, OMB NO. 40-R3712

EXHIBIT C

FORM GR 470-32
(3/75)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY

Alfalfa (Medicago sativa L. complex)

NAME OF APPLICANT(S)
Cornell University Agricultural Experiment Station

ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code)
Department of Plant Breeding and Biometry
New York State College of Agriculture and Life Sciences
Cornell University, Ithaca, New York 14853

VARIETY NAME OR TEMPORARY DESIGNATION
Multileaf

FOR OFFICIAL USE ONLY

PVPO NUMBER
73100

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

NOTE: For single plant data a minimum of 100 plants is suggested

1. PRIMARY AREA OF ADAPTATION

[3]
1 = NORTHWEST
2 = NORTHCENTRAL
3 = NORTHEAST
4 = SOUTHEAST
5 = SOUTHWEST
6 = SOUTHERN PLAINS
7 = INTERMOUNTAIN

INDICATE AREA WHERE TEST WAS CONDUCTED. FURTHER EXPLANATION CAN GO IN COMMENTS AT THE END OF THE FORM.

[3] AREA TESTED

2. WINTER HARDINESS

[5]
1 = NON-HARDY (Mesa Sirsa)
3 = INTERMEDIATE NON-HARDY
5 = MODERATELY HARDY (Saranac)
7 = HARDY (Vernal)
9 = EXTREMELY HARDY (Norseman)

[3] AREA TESTED

[2] SOURCE OF INFORMATION: 1 = ANTICIPATED 2 = MEASURED

3. FALL GROWTH HABIT

[5]
1 = ERECT (Mesa Sirsa)
3 = SEMIERECT (DuPuits)
5 = INTERMEDIATE (Saranac)
7 = SEMIDECUMENT (Vernal)
9 = DECUMBENT (Norsement)

[3] AREA TESTED

4. RECOVERY AFTER FIRST SPRING CUTTING

[3]
1 = VERY FAST (Mesa Sirsa)
3 = FAST (Saranac)
5 = INTERMEDIATE
7 = SLOW (Vernal)
9 = VERY SLOW (Norseman)

[3] AREA TESTED

5. FLOWERING DATE (FIRST SPRING GROWTH)

[0][3] DAYS EARLIER THAN . . . . .
[0][0] DAYS LATER THAN . . . . .

[4] / [3]
1 = MESA SIRSA
2 = LAHONTAN
3 = SARANAC
4 = VERNAL
5 = NORSEMAN

[3] AREA TESTED

6. CROWN TYPE

[7]
1 = SPREADING ROOTS
3 = SPREADING RHIZOMES (Teton)
5 = BROAD (Vernal)
7 = INTERMEDIATE (Saranac)
9 = NARROW (Mesa Sirsa)

[3] AREA TESTED

7. PLANT COLOR

[4]
3 = DARK GREEN (Weevlchek)
5 = GREEN (Vernal)
7 = LIGHT GREEN (Ranger)

[3] AREA TESTED

8. HAIRINESS

[ ][ ][ ] % PLANTS WITH PUBESCENT STEMS

[ ][ ][ ] % PLANTS WITH PUBESCENT PODS

9. POD SHAPE

5

[0][9][8] % PLANTS WITH TIGHT COILS

[0][0][2] % PLANTS WITH LOOSE COILS

[0][0][0] % PLANTS WITH SICKLE PODS (Less than 1 coil)

10. GIVE ITEM LENGTH FREQUENCY DISTRIBUTION FOR SUBMITTED AND 1 TO 5 STANDARD VARIETIES 1/

VARIETY NAME	STEM LENGTH FREQUENCY DISTRIBUTION 2/											AVERAGE STEM LENGTH
	0 – 5 mm. %	6 – 10 mm. %	11 – 15 mm. %	16 – 20 mm. %	21 – 30 mm. %	31 – 40 mm. %	41 – 50 mm. %	51 – 60 mm. %	61 – 70 mm. %	71 – 80 mm. %	81 + mm. %	
Multileaf		46.0		37.2	12.9	2.6	0.5	0.5	0.0	0.0	0.0	13.40
Lahontan		19.8		48.9	20.4	7.7	2.3	0.0	0.2	0.2	0.0	18.10
Saranac		69.7		24.8	4.8	0.5	0.0	0.0	0.0	0.0	0.0	10.00
Iroquois		71.7		23.8	3.8	0.2	0.0	0.2	0.0	0.0	0.0	9.80
Vernal		82.5		14.6	2.5	0.0	0.2	0.0	0.0	0.0	0.0	8.60

11. FLOWER COLOR 3/ (DETERMINE COLOR ON FRESHLY OPENED FLOWERS)

0 9 8 % PURPLE | 0 0 2 % VARIEGATED | 0 0 0 % YELLOW | 0 0 0 % CREAM | 0 0 0 % WHITE

12. DISEASE, INSECT, AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

DISEASE	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
BACTERIAL WILT	Multileaf (SUBMITTED)	23.5	2.37	.42	University of Minnesota 1974, Rosemont, Minn. Field
	(RES. CK.) VERNAL	35.1	2.14		
	(SUS. CK.) NARRAGANSETT	00.0	4.30		
ANTHRACNOSE	Multileaf (SUBMITTED)		4.78	.48	U.S. Regional Pasture Research Laboratory, 1975, State College, Pa. Greenhouse
	(RES. CK.) ARC		2.68		
	(SUS. CK.) SARANAC		4.84		
COMMON LEAF SPOT	(SUBMITTED)				
	(RES. CK.) RAMSEY				
	(SUS. CK.) RANGER				
DOWNY MILDEW	(SUBMITTED)				
	(RES. CK.) SARANAC				
	(SUS. CK.) KANZA				
PHYTOPHTHORA ROOT ROT	(SUBMITTED)				
	(RES. CK.) AGATE				
	(SUS. CK.) SARANAC				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

1/ Preferred standards: Saranac, Vernal, Norseman, Lahontan, Mesa Sirsa. Twelve hours light at 25° C with 20,000 lux of cool white florescent; 2,000 lux of incandescent filament light and twelve hours darkness at 5°C.

2/ From cotyledonary node to tip of stem 20 days after planting.

3/ For further clarification consult USDA Agricultural Handbook No. 424.

4/ Give: The institution in charge of test, (2) year, and (3) location of test. Describe test procedure if it differs from procedure suggested in ARS-NC-19, September 1974.

12. DISEASE, INSECT, AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

DISEASE	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

INSECT	CULTIVAR	% SEEDLING SURVIVAL	AVG' SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
PEA APHID	(SUBMITTED)				
	(RES. CK.) KANZA				
	(SUS. CK.) RANGER				
SPOTTED ALFALFA APHID	(SUBMITTED)				
	(RES. CK.) KANZA				
	(SUS. CK.) RANGER				

INSECT	CULTIVAR	% DEFOLIATION	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
ALFALFA WEEVIL	(SUBMITTED)				
	(RES. CK.) ARK				
	(SUS. CK.) VERNAL				

INSECT	CULTIVAR	% RESISTANT PLANTS	EMERGED ADULTS PER PLANT	EMERGED LSD .05	TEST, YEAR & LOCATION 4/
ALFALFA SEED CHALCID	(SUBMITTED)				
	(RES. CK.) LAHONTAN				
	(SUS. CK.) SONORA				

INSECT	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
POTATO LEAF-HOPPER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

4/ Give: The institution in charge of test, (2) year, and (3) location of test. Describe test procedure if it differs from procedure suggested in ARS-NC-19, September 1974.

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12. DISEASE, INSECT, AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

INSECT	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				
NEMATODE	**CULTIVAR**	**% RESISTANT PLANTS**	**INDEX (ASI)**	**ASI LSD .05**	**TEST, YEAR & LOCATION 4/**
STEM NEMATODE	(SUBMITTED)				
	(RES. CK.) LAHONTAN				
	(SUS. CK.) RANGER				
NORTHERN ROOT KNOT NEMATODE	(SUBMITTED)				
	(RES. CK.) NEV. SYN. XX				
	(SUS. CK.) LAHONTAN				
SOUTHERN ROOT KNOT NEMATODE	(SUBMITTED)				
	(RES. CK.) MOAPA 69				
	(SUS. CK.) LAHONTAN				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

13. INDICATE A VARIETY THAT MOST CLOSELY RESEMBLES THE VARIETY SUBMITTED FOR THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
AREA OF ADAPTATION	Saranac	PLANT HEIGHT	Saranac
RECOVERY AFTER CUTTING	Saranac	WINTER HARDINESS	Saranac

REFERENCES

Barnes, D.K., and C.H. Hanson, An Illustrated Summary of Genetic Traits in Tetraploid and Diploid Alfalfa, ARS Technical Bul. 1370.
Barnes, D.K., et al, Standard Tests to Characterize Pest Resistance in Alfalfa Varieties. ARS-NC-19, September 1974.
Nittler, L.W., G.W. McKee, and J.L. Newcomer, Principles and Methods of Testing Alfalfa Seed for Varietal Purity. New York Agricultural Experiment Station Bul. 807.
USDA Agricultural Handbook No. 424.

COMMENTS

1. Observations on first flower are subjective and variable with degree of infestation of insect pests and weather damage.

2. Data under item 10; measurements made on approximately 350 seedlings grown in soil after 30 days as per Nittler et al, 1964.